

D&D Subgroup Highlights

April 4, 1998

This meeting was held in the Wenatchee River Room starting at 9:00 a.m.

Electrically Switched Ion Exchange (ESIX)

Mike Lilga, PNNL, gave a viewgraph presentation on this new technology being developed with funding from the DOE EM-50 Efficient Separations and Processing Crosscutting Program. Also involved with the research are the University of Washington and a private firm, Electrosynthesis Co., Inc. The ESIX concept does not involve the use of any acids or bases in solution and no external chemicals are needed to regenerate the system. There is minimal secondary waste generation, no ion exchange resins to dispose of, and lower capital costs compared to an RF resin system. Some of the other advantages of the ESIX system are that it is remotely operated, has less worker exposure, and is mobile and small. Some of the targeted waste streams for ESIX include INEEL ICPP dissolved calcine waste and process water from D&D, effluent treatment facilities, etc. The current ESIX research objective was to evaluate a number of electroactive films for separating Cs from solutions that have high Na concentrations. New films are being tested now, including some for Sr and TRU elements. The ESIX can be operated in either a flow-through or flow-by mode with stacks of cells to achieve the desired concentration. Mike then presented the results of a study done on K-Basin waste decontamination with ESIX. The results showed that ESIX would save \$1.5 million per year as compared to the current method or baseline. This would result in a payback period of about four months. A large-scale ESIX system will be in operation by the end of the FY. Mike said they are looking for potential Site users of ESIX. To use ESIX effectively, the contaminant loading should be 100 ppm or less. A question was raised as to whether ESIX would work at the WESF cells. Mike said they have not looked at the removal of TRUs from waste streams yet.

COGEMA Engineering Capabilities/Products

Pascal Omnes (COGEMA) and Thierry Flament (NHC) presented a viewgraph presentation about COGEMA Engineering, a French company, and some of the D&D technologies and applications they have used. NHC, through the expertise of its French employees, can help identify and propose technologies to be implemented at Hanford through COGEMA. COGEMA carries out the task of decontamination and dismantling with the objective of limiting the production of secondary waste/effluent, maintaining protection for workers and the environment, and enhancing time and cost savings. Over the years, COGEMA has built up experience in D&D of nuclear facilities including support to operations, reuse of refurbished facilities, and the closure of facilities. Pascal reviewed COGEMA's French experience in D&D in a number of facilities. Among the main steps of D&D, the decontamination and characterization of facilities were seen as the major ones at Hanford. Each of these were addressed separately.

Thierry Flament discussed the decontamination technology experience that could be used at Hanford. Decontamination technologies need to remove contaminants from surfaces, process the secondary waste streams, and measure the amount of nuclear material present. Industrial lasers

have been used by COGEMA, including for the removal of dust from MOX fuel pellets and to decontaminate zircalloy cladding before shipment of fuel assemblies. There is a need to have a well-defined surface for an optimum laser/material interaction. The high cost of using lasers may not make them well-fitted for dismantling activities. Thierry reviewed the steps and criteria used to choose a chemical reagent and how to implement chemical decontamination processes. Foam decontamination of a production reactor gas cooler was described in detail. This work was done in 1993 and three foams were used to clean the gas cooler successfully. Since then, foam has also been used to clean the piping in production reactors and is planned to be used to clean a secondary steam generator, pneumatic transfer lines, and in the dismantling of a reprocessing plant. Gel decontamination is another technique used by COGEMA. An example was presented of the internal decontamination of a high-activity (10 REM/hr.) effluent storage tank in France. Three types of gel were applied and then rinsed off with water to clean this large (> 13,000 gallon) tank. Gel decontamination has also been used to clean gloveboxes and cells contaminated with Pu. Some of the places at Hanford where foam decontamination could be used include ventilation pipes, process piping and parts of B-cell. Gel decontamination may work in PFP gloveboxes and various tanks on-site.

Pascal talked about a new characterization technique, Gamma 3-D Imagery. The Gamma 3-D camera can be used on D&D, maintenance, and modification projects. Some of the uses for the gamma camera include pinpointing hotspots to prioritize waste removal, preparation/training for maintenance operations, surveying/characterizing high-dose contaminated areas without requiring personnel entry, mapping difficult to reach areas, and updating old/out-of-date drawings prior to future work. Through the use of digital photogrammetry the 3-D gamma camera will allow one to pinpoint hotspots on equipment or within a facility. This can be used to produce CAD models showing the hotspots with full dimensional details. The gamma 3-D camera is a combination of real-time gamma imaging and digital photogrammetry without using targets. Pascal showed the results of a survey of a process cell. In addition to mapping contaminated facilities, the camera is also used for surveillance of waste. The camera is portable and flexible enough to fit in gloveboxes. Pascal says the gamma camera will be at Hanford in a few weeks. Please contact him if you would like to see it and have a demonstration.

Miscellaneous Updates

Robbin Duncan reported that he is putting together a strategy plan for use of the laser cutter at Hanford. This plan will be used to show EM-50, -60 and contractor management of the laser's potential. It will include a breakdown of funding needs and insertion points for the use of the laser on various tasks. Right now there is a lack of funding to proceed much further. The results of this plan will be presented at the next subgroup meeting. Shannon Saget said she will check with the DDFA to see if funding is still available this FY for the laser cutter.

The C-Reactor Large-Scale Demonstration Project had completed 22 technology demonstrations by the end of March. There is going to be a closing ceremony for the C-Reactor Project on October 8.

Safety analysis and work planning is underway on the Canyon Disposition Initiative. The plan is

to have technologies being demonstrated in the building in July. This FY, work will begin in the cells on visual and dose imaging/mapping. Technology needs statements are being prepared for this year's work now. A technology selection group is being formed and criteria will then be developed for selecting technologies to be demonstrated. A web site may be put together on this project also.

The DDFA mid-year review is scheduled for May 5-7 in Morgantown, West Virginia. There will be a C-Reactor presentation and a number of subgroup members will be in attendance for the review. The Spectrum '98 Conference will be held in Denver on September 13-18.

Jim Goodenough talked about the 233-S pipe-cutting project taking place. Various techniques are to be tried to remove piping from processing cells. Jim said he would like them to present the results of this project to the subgroup after they finish. One thing they are doing is using foam to stabilize the Pu in the pipes before dismantling the piping.

Shannon Saget handed out information on technology insertion points (TIPs). This is part of a draft document now being finalized that EM-50 staff are working on, which will be part of the Site baseline documentation. Also, part of the draft document are technology deployment opportunity fact sheets. Copies of six of these fact sheets for D&D technologies to be deployed this FY were also distributed. Wayne Green passed out a tentative schedule for the Science and Technology needs identification and write-up process for this FY. At the May subgroup meeting the final schedule will be presented and the STCG's role will be reviewed.

Attendees

Gary Ballew	PREC	946-0611
Singh Bath	FDH	376-1840
Ron Borisch	BWHC	372-3382
Dennis Brown	DOE-RL	372-4030
Robbin Duncan	BWHC	373-2229
Don Engelman	NHC	372-6536
Thierry Flament	NHC	372-1682
Jim Goodenough	DOE-ER	376-0893
Wayne Green	FDH	372-6533
Bob Julian	Ecology	736-5702
Kim Koegler	BHI	372-9294
Dave Langstaff	DOE-RL	376-5580
Mike Lilga	PNNL	375-4354
Pascal Omnes	COGEMA Engrg. Corp.	376-1032
Rick Orth	PNNL	375-6709
Shannon Saget	DOE-RL	372-4029
Steve Weakley	PNNL	372-4275